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ABSTRACT

The influence of five programs of the Mt. Druitt Early Childhood Project on the development of preschool children's vocabulary and syntactical skills was assessed in a pretest/posttest design. Programs differed in the amount of structure they imposed on the language experiences of the children and in the content they specified. Different measures were selected for assessing children's use of vocabulary and basic and elaborated syntax. Vocabulary was measured by the Circus I Test: What Words Mean. Basic syntax was assessed in the areas of the correct use of pronouns, tenses, voice, and subject/object relationships. Experimenters used three methods of measuring children's control of syntactic structures: imitation, comprehension, and production. Speech samples were collected to assess children's use of elaborated syntax. A controlled situation was used so that direct comparisons could be made between children enrolled in different programs. Indexes chosen to represent ability in elaborated syntax were the Noun Complexity Index and the Verb Complexity Index. In addition, the mean length of utterance was computed. The posttest data revealed significant differences in scores obtained by children in different programs in both the vocabulary test and the comprehension subtest of the syntax test. The practices of the different programs did not influence the children's syntactical development as measured by imitation and production. (Author/RH)

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PROJECT EVALUATION REPORT

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An Analysis of the Vocabulary and Syntax Development of Preschool Children.

Jillian Belme

PS012047

This draft paper reports specific aspects of evaluation activities not presented in detail in the Project's Final Report. Comments or requests for further information may be addressed to the Project, care of the above address.

NUMBER 7

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Preface

Language development is an area of central importance in school learning. This report presents an evaluation of the development of vocabulary and syntax skills in young preschool children in the Mt Druitt area. The evaluation attempted to tap children's language development through both structured and open-ended methods.

The cooperation of school, teachers and parents was essential if the study was to eventuate. Above all the patience and good humour of the children, who were almost always pleasant and willing subjects made the task an easy, and at times a delightful one. It is hoped that the information generated by the study may be used to assist other children of this age group.

The author would also like to recognise the services of many people at Macquarie University who gave advice on aspects of the study. In addition, the careful work of research assistants who had the painstaking task of ploughing through taped transcripts is appreciated.

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1. Introduction

This report presents an evaluation of preschool children's language development undertaken as part of the Mt Druitt Early Childhood Project. This is a major educational project which sought to document the effects that different educational experiences at preschool level had on the skills and abilities of young children. The development of language skills was considered an important outcome of the preschool programs set up as part of the Project. Consequently, evaluation measures were needed to focus on areas of language development featured in all programs, so that potential differences among programs could be examined. Two general areas numbered among the goals of all programs, vocabulary and syntax. Consequently, these language areas were fully evaluated.

2. The Role of Language in Early Childhood Programs

Language development in young children has received increased attention since studies done by some psychologists have stressed the importance of early environmental influences and especially language, in developing cognitive processes in young children (Vygotsky, 1962; Hunt, 1961). Moreover, children advanced or competent in language and verbal development seem better able to cope with learning tasks demanded by the schooling process. It is not surprising then, that despite wide differences in philosophical approach, most recently devised models for preschool education highlight objectives for language development and usage in their curricula.

An examination of objectives for language in preschool programs reveals a heavy emphasis on cognitive objectives. General categories in the cognitive objectives show a concern with developing simple and elaborated language forms in vocabulary and syntax so that language can be used effectively for specific purposes, such as understanding complex directions, relating experiences, categorising and generalising, and dramatic play (Cazden, 1971). Generally, the goal is to increase the child's ability to understand and produce oral language for a widening variety of purposes, which the preschool environment may have provided for the child for the first time. Most preschool programs also include affective objectives, such as enjoyment of books and stories, and pleasure in verbal interactions with adults and peers (Cazden, 1971).

Educators recommend different methods for achieving language goals depending on their philosophical orientation and the degree of specifity stated in the program objectives. Some teacher-structured programs such as the Bereiter-Engelmann program tend to have graded specific objectives mainly in the cognitive areas of language development, which are taught by direct recitation and drill methods. These objectives are deemed to be necessary for success in later stages of schooling (Bereiter and Engelmann, 1966). On the other hand, child-centred programs, with little teacher structure and where the children's interests determine their activities, have less specific objectives. In addition, there are programs which subscribe to the enrichment philosophy, but use semi-structured dialogue methods for teaching language expressing such concepts as position and time (Blank and Solomon, 1968; Klaus and Gray, 1968).

The five programs in the Mt Druitt Project differed in the amount of structure they imposed on the language experiences of the children and in the content they specified. The Behaviourist and Competency program emphasised language skills which would be useful to the child in later stages of schooling. The Behaviourist program offered many teacher-initiated activities designed to increase children's vocabulary, to improve their knowledge of language-based concepts such as temporal and positional concepts, to increase the children's skills in narration. The Competency program

emphasised the same objectives, but provided a more informal framework for teaching them to children. Small group work was supplemented by informal teacher contacts with individual children.

The Cognitive program stressed the ability of children to use language to support and describe the logical concepts which were at the centre of the program, e.g. seriation, classification. The program also emphasised the use of both written and oral language centring on children's representational activities. This included the extension of vocabulary skills, and the development of clear syntax. The Contemporary Program required teachers to extend children's language through activities initiated by the children. Hence the development of interaction and negotiation skills in the children was stressed. Through conversation and small group activities, the vocabulary of the children was extended and more complex syntax was encouraged. Some attention was also given to the expression of temporal and positional concepts.

The Home-Based program elaborated objectives for both the child and mother, whose role as a teacher of her child was stressed. Home-Based teachers attempted to develop the children's vocabulary and syntax, and to assist mothers acquire skill in developing their children's language through informal, everyday contact.

The language evaluation was designed to deal with the more general of these language goals eg. the development of syntax and vocabulary, since more specific objectives were assessed independently within each program.

3. The Developmental Bases of the Evaluation

The present study aimed to conduct a detailed study of children's syntax. A review of the literature in the field revealed that selection of appropriate levels of testing could be made on generalisations concerning the young child's acquisition of syntax available from recent research (Brown and Fraser, 1964; Brown, Cazden and Bellugi, 1969; Brown, 1973; Menyuk, 1969; Brown and Bellugi, 1972; Bellugi and Brown, 1964; McNeill, 1966b). Children reveal in their spontaneous speech a growing mastery of language by correctly using such features as different sentence types, morphological inflections, and syntactic transformations more frequently. Certainly, at four years of age, children generally have mastered the basic rules of grammatical structure and are able to understand and produce simple, declarative sentences. While children appear to acquire particular structures in a set order, there are differences in the rate of acquisition (Brown and Fraser, 1964).

Such studies provided guidelines for the development of evaluation procedures of syntax in young children 2-4 years of age. These took the form of detailed case studies done with small numbers of children over a long period of time (Brown, Cazden & Bellugi, 1969; Braine, 1971). These longitudinal studies suggested what types of structures might be relevant to study and evaluate but provided no methodology for collecting data and no complete model of language description. The present study called for large numbers of children to be tested, and an evaluation model appropriate to these conditions was formulated.

4. The Derivation of the Evaluation Model

Chomsky has developed an elegant model of language description, able to describe all possible utterances of the language whether they occur or not (Chomsky, 1957, 1965). It describes the language of children of this age group at morphological, phrase structure and transformational levels of the grammar and provides the basis for a thorough analysis of children's syntactical development.

Chomsky postulated the development of two modes of functioning with language, which were called competence and performance. From listening to speakers around them, young children develop a set of rules, which Chomsky called the user's competence (Chomsky, 1965). By using this set of rules, very young children produce novel utterances that they have not heard before, but which other speakers of the language immediately understand. The ability to produce sentences to express a range of meanings, intentions and states, Chomsky called a speaker's performance. By analysing samples of an individual's performance, and noting both the structures used and the type of errors made, inferences can be made about the rules being used to formulate utterances. From such utterances, Chomsky argues, it is possible to obtain some indication of the child's language *competence*.

Other investigators into child language development have emphasised the importance of the competence/performance distinction (Smith, 1973; McNeill, 1966a, 1966b). The utterances the child makes are often fragmentary, and to adult ears, 'ungrammatical'. Therefore, when dealing with the language of young children, the device used to describe their sentences must be able to describe ungrammatical as well as grammatical sentences. Only in this way can links between a child's competence and performance be forged, and progress made in understanding the nature of the child's competence.

It should be noted that performance does not reflect *competence* (Smith, 1970). Strictly speaking, to study children's *competence*, the researcher must ask children to comment on the grammaticality of sentences presented to them. Obtaining linguistic judgments of this kind from young children is problematic (Brown, Fraser & Bellugi, 1964).

Where it has been attempted (de Villiers and de Villiers, 1974) interesting results were obtained. Children assessed to be 'more advanced' in terms of Mean Length of Utterance were more often able to detect wrong-word-order sentences. Their 'corrections' however were more often based on semantic considerations than word order. At its present stage of development this technique does not yield information about a child's grammatical competence, although it points to the difficulty of looking at children's competence in syntax separately from other aspects of their linguistic competence.

Theoretically, to be able to account for performance in other than superficial ways, the researcher must show how it derives from competence (McNeill, 1966a). There must be some relationship between the regularities of the child's grammatical knowledge and the patterns of his speech. Although explanatory models exist (eg. Chomsky's generative grammar), there is no general agreement on the nature of the relationship between proposed linguistic models and the language user's competence.

While there does not appear to be a direct way to test for competence, it is possible to study the child's comprehension of language, which is a category of performance (McNeill, 1966a). Comprehension has been categorised as understanding, a notion which, in the area of syntax implies understanding of the structure of the sentence (Smith, 1973). It is not clear whether syntactic structure is the most important element in understanding a sentence. None the less, controlled experimental conditions could provide a setting for testing the child's understanding of certain grammatical structures and contrasts.

Other researchers, working from a theoretical rather than an expirical perspective more clearly interrelate the definition of competence and performance used by linguists and psychologists (Fodor and Garrett, 1966). The linguist is correct in pointing out that a theory derived from a corpus of spontaneous speech need not be related in any way to a theory of language. Speakers can only produce a small, finite, arbitrary set of sentences and many of the structured relationships described in a grammar may not occur in the corpus. Moreover, speakers know a great deal about the theory of language, eg. notions of grammaticality, semi-grammaticality and ambiguity which are not evident in the corpus. These aspects of language knowledge from part of a theory of language as described in Chomsky's transformational grammar.

5. Language Research in an Educational Setting

Cazden,(1972a) proposed a model based on the competence/performance distinction for investigating children's language development. She suggests, however, that *performance* requires an elaborated definition for educational researcher. Consequently, a distinction was made between Performance A, which represents verbal abilities, and Performance B, which represents verbal habits.

Performance A describes what a child can do, affected by such intra-personal factors as attention and memory. The variables affecting Performance B are interpersonal ones, such as setting, topic, participants and language functions. Performance A is assessed in an experimental situation, while Performance B has natural speech situations as its context. Cazden (1972a) claims that these form a continuum, on which lies in order of increasing complexity - competence, Performance A and Performance B. This model suggests that both test data and spontaneous speech samples must be collected to gain a detailed picture of children's syntactic performance.

Cazden's model suited the evaluation intentions of the Project and was accepted because it met the theoretical criteria of distinguishing between competence and performance. Results could be used to compare curriculum effects, and an independent study of the language performance of children could be made. Measures and methods of data collection were based upon this model.

6. Selection of Measures

Measures were sought which were appropriate to both the objectives of the Mt Druitt Early Childhood Project and the language evaluation model put forward in previous sections of this paper. Data were collected on individual children, because the Project was committed to specifying the effects of the five programs upon individual children. Consequently data were collected on children's vocabulary and basic syntax which were the major areas of language the five programs sought to influence. However the collection of spontaneous speech samples of individual children within the naturalistic preschool setting, although desirable, became a difficult undertaking on such a large scale. Therefore individual speech samples in controlled settings were collected. These samples would be analysed to assess children's use of elaborated syntax.

Assessment of children's language, therefore, included vocabulary, basic syntax and elaborated syntax which are listed as the major areas of achievement in language of children in preschools (Cazden, 1971). The vocabulary and basic syntax data evaluated Performances A, and the Child Interview data evaluated Performance B.

A careful review of existing standardised and non-standardised measures used for assessing preschool children's language development highlighted the difficulties in finding appropriate instruments. An exhaustive discussion of the issues in dealing with standardised tests in preschool language assessment has been put forward by Cazden (1971). Standardised language tests used in evaluation projects often yield disappointing and ambiguous results. For example the most frequently used measures to assess language objectives of preschool programs are the Stanford-Binet (S-B), the Peabody Picture Vocabulary Test (PPVT) and the Illinois Test of Psycholinguistic Abilities (ITPA). These were all rejected because previous studies had adequately documented the effects of curricula on young children through an interpretation of data collated from these tests.

It was decided to measure vocabulary, basic syntax and elaborated syntax separately. Vocabulary was measured by the Circus I test What Words Mean (E.T.S. 1974). This is a receptive vocabulary measure designed for preschool program evaluation. It provides a standard comprehension situation, i.e. the selection of one picture from an array of three.

Basic syntax was measured by a modified version of a test designed to assess ten basic syntactic structures (Fraser, Bellugi and Brown, 1963). These structures include the major areas of syntax development of this age group eg. the correct use of pronouns, tenses, voice and subject/object relationships. The experimenters used three methods of measuring children's control of syntactic structures; imitation, comprehension and production. Their research carefully examined the processes involved in imitation, comprehension and production and their experimental evidence indicated that imitation of any particular structure preceded comprehension of it and similarly, comprehension preceded production. Various replications have produced different results, but production has never exceeded comprehension (Lovell & Dixon, 1967, Fernald, 1972, Nurss & Day, 1971). Some researchers have claimed that comprehension must precede production as a 'linguistic universal of acquisition', so that the young child will always understand more syntactic structures than he can produce (Ingram, 1974).

In the present study, imitation, comprehension and production were used to represent three different types of control that children develop over grammatical constructions. By using all three in a language evaluation, the performance model is more fully explored and more completely assessed.

Speech samples were collected to assess children's use of elaborated syntax. A controlled situation was used so that direct comparisons could be made between children enrolled in different programs. This task was called the Child Interview. The Child Interview procedure was a semi-structured interview designed to elicit a corpus of productive language from the child. The data gained were analysed to describe the child's use of elaborated syntax as indicated by complexity of noun phrases and verb phrases. The indexes chosen to represent ability in elaborated syntax were the Noun Complexity Index and Verb Complexity Index (Cazden, 1965).

In addition the Mean Length of Utterance was computed which is a reliable measure of language maturity, since studies have indicated that complexity of syntax increases as Mean Length of Utterance increases (Brown, 1973; Cazden, 1968).

The research model for the language evaluation, showing how Performance A and Performance B were assessed is presented in Table 1.

TABLE 1: Research model for language measures

	Performance A	Performance B
Vocabulary	Circus I Receptive Vocabulary Content Words nouns verbs modifiers	Child Interview
Basic Syntax	Test of Grammatical Contrasts Understanding and production of basic grammatical structures	Production of basic grammatical structures
Elaborated Syntax		Production of elaborated syntax as indicated by complexity of noun phrases and verb phrases
	Analysis of errors provides information on competence	

7. Reliability and Validity of the Measures

a) Circus 1 - "What words Mean"

The preschool years are a time of rapid vocabulary development. There are marked individual differences in the size of vocabulary among children, reflecting their degree of language maturity. In addition, the variety of experiences children have affect vocabulary size.

The understanding of vocabulary or meanings of words is considered an important scholastic skill, significant in predicting later school success. It has been claimed, in fact, that vocabulary is the best single item for predicting school success (Dale, 1965b; Dunn, 1965). Various studies show that results on tests of vocabulary correlate highly with tests of reading ability (Circus 1 Users Guide, 1975; Dale, 1965b). This is not surprising since technical analyses have shown that vocabulary level is the best index of the readability level of materials (Dale, 1965a). An adequate vocabulary is basic to a child's ability to express needs, feelings and concepts. In particular, children need control of a wide variety of content words to be able to understand and produce verbal communications.

The most difficult problem associated with the construction of a vocabulary test is the selection of items to include. Content validity for the test depends heavily on the methods used to select items. Early studies which attempted to estimate the total size of the vocabulary of children and adults from testing with a limited sample of words produced considerable variation in estimation depending on the sampling methods used (Lorge and Chall, 1963).

Circus 1 consists of 40 items selected from the Wepman & Hass spoken word count of 5,6 and 7 year children (Circus Manual, 1974). Vocabulary tests are customarily built on word inventories of various kinds, e.g., dictionaries, frequency lists, written word counts, spoken word counts, etc. (Dale, 1965a; Lorge and Chall, 1963; Stern, 1969). For children of the preschool age group, who have not yet learned to read a spoken word count is a developmentally appropriate and valid universe of items. For older children, whose reading vocabularies are larger than their spoken vocabularies, sampling from wider inventories, i.e. dictionaries, is a more valid procedure.

Two other criteria impose requirements on the selection of words for the test, one of these is concerned with the structure of the language itself and the other with the method of testing. These two criteria are interdependent. Ideally, all the major grammatical form classes should be represented in the manual for the selection of items from different grammatical classes. The lexicon of the language is viewed as comprising two broad classes of words; content words (nouns, verbs and modifiers) and function words (including prepositions, articles, pronouns and conjunctions) (Circus 1 Users Guide, 1974). Content words comprise the vast majority of vocabulary items and carry most of the information in communcation.

The choice of a receptive test places constraints on the selected words because items on the test will be coded in pictures, to maintain a similarity of stimulus. This restricted the choice of items to content words. However, Circus 1 has examples drawn from the three main sections of content words in the grammar, i.e. nouns, verbs and modifiers. In addition, function words, such as prepositions which can be tested receptively are included in items in other tests used in the Project evaluation, e.g. the P.S.I.

In terms of the test itself, and as a measure which complements others used in the evaluation, the content validity of Circus 1 appears satisfactory. The test was piloted in the original form in 1976, to detect any items that may prove difficult for the children because of inbuilt cultural or environmental biases. Two types of change were made. For two items, the label itself was charged.

Item 12: drapery became curtain because curtain was the accepted Australian term for the object depicted.

Item 20: orchestra became musician because orchestra did not seem to be within the experience of many of the children from this particular area.

These changes were based on observing and questioning the children during piloting, and on item analyses showing that these items discriminated poorly between children. A complete list of words used in the Circus 1 test is set out in Appendix A.

The items in the verb subscale were presented in the 'ing' gerund form. Piloting indicated that the children found this form easier to understand. It also gave better flow to the statements making up the instructions to the test. This is developmentally appropriate since research indicates that children of the preschool age group make few errors in attaching appropriate inflections to their correct forms (Cazden, 1968). Certainly consistent recognition and understanding of the 'ing' form is within the developmental capabilities of the children tested.

b) The Basic Syntax Test

A measure to assess the development of basic syntax in children was sought to complement the vocabulary measure in providing information about the linguistic abilities of individual children at Mt Druitt. The content and procedures of the test used were styled on those outlined by Fraser, Brown & Bellugi (1963). The structures used in the test are set out in Appendix B.

As part of the piloting in 1976, a critical investigation into the validity and reliability of the measure was carried out. The two main aims of this investigation was to establish the content validity of the structures chosen for testing and the validity of the procedures used to test them.

The validity of the items in the syntax test is supported by information from long term research studies which have drawn up guidelines for the acquisition of syntactic structures in the language of young children (Brown, 1973; Brown & Fraser, 1964; Cazden, 1968; Miller, 1973). Other researchers have investigated the control young children have over various aspects of English syntax (Berko, 1958; Menyuk, 1963b). Both in terms of length and complexity of utterance, the content of the present measure are suited to the developmental level of the children tested.

The method of testing was carefully chosen because it had to be reliable for the age group chosen. There are many methods for testing the syntactic abilities of young preschool children. The linguistic model used for the present evaluation requires that both comprehension and production be tested. As pointed out in a different context, the development of grammar cannot be successfully assessed by examining a section of the child's grammatical knowledge as expressed in a short period of time. Some reliable elicitation device is necessary.

A review of the literature revealed two basic techniques for assessing productive language: oral completion items and imitation. Oral completion or closure was successfully used with children of the preschool age group by other researchers, notably Jean Berko in her study of young children's acquisition of the morphological system in English (Berko, 1958). Tag questions can also be used to elicit information about the child's control of pronouns and verbs (Slobin, 1967). The tag-question method is attractive because of the predictability of response, but it can be unreliable and inconsistent when used with young children (Cazden, 1971). Both of these techniques were useful for collecting precise information about a small sub-section of the grammar.

Imitation as an elicitation technique was preferable for the present research for three separate reasons. It was compatible with the competence/performance model on which this study was based and it was capable of yielding information about children's language competence. As well it was also easy to administer to preschool aged children for the technique had been successfully used by various researchers with children as young as two years of age and as old as six years of age (Slobin & Welsh, 1968, Menyuk, 1963a).

Strong evidence indicating that when children imitate model utterances presented to them they process them syntactically, is provided by two pieces of research. Both Slobin & Welsh (1968) and Menyuk (1963a) concluded from the performance of their young subjects on imitation tasks that the process of sentence recognition includes retrieval of both form and content. Two possible processes can take place (Slobin & Welsh 1968). On the one hand, the child may react to the structure of the model sentence, and may be intent on the reproduction of form, say two coordinate clauses joined by "and". Syntactic structures take up space in short term memory so that content will be sacrificed to the retention of form in immediate rote imitiation. On the other hand, if the syntactic structure presented is very much more advanced than is exhibited in his spontaneous speech, the child may recode the content of the utterance. The imitation then will be recorded in the child's own syntax (Menyuk, 1963a).

This hypothesis of imitation being dependent on structure rather than mere repetition, is further strengthened by examining the kinds of responses children give in response to model sentences which are too difficult for them to imitate. Successful imitation does not appear to be correlated to sentence length, but to sentence complexity (Menyuk, 1963a, Brown & Fraser, 1964). Preschool aged children typically produced two kinds of deviation from complete repetition. They modified transformations which were too complex for them by imposing their own syntactic structure on them. The responses always took the form of using a set of rules which come earlier in the grammar than that used in the model sentence (Menyuk, 1963a). They also corrected retracted forms i.e. forms which an adult would view as 'unacceptable' or 'ungrammatical'. They could produce corrections for omission and redundancies at the two syntactic levels of the grammar-phase structure and morphology (Menyuk 1963a). The fascinating fact of this result is that while children could demonstrate their competence by correcting these forms, all the deviations used in this experiment had been taken from language samples of the preschool and kindergarten children studied in the experiment (Menyuk, 1963a).

It appears that in imitation recoding is taking place. In general, the research indicates the following generalisations about children's imitation of model sentences.

1. Children can imitate longer sentences than they can spontaneously use.

2. They omit features in imitation that are developmentally too difficult, and have little semantic content e.g. articles, copula.

3. The number of words or morphemes is clearly not a measure of how much of a sentence a child can imitate. Systematic features that are developmentally too difficult will be dropped, even in utterances where the morpheme count is within spontaneous abilities (Slobin & Welsh, 1968).

This evidence shows that imitation is a strong, informative tool for yielding data about children's language development. In the test selected for measurement, imitation is the basic elicitation method used. Imitation is a straight repetition task, while production requires the selection of a correct response to an indicated referent as well as imitation of the utterance presented. An analysis of errors made is considered an important part of the evaluation, since such a qualitative analysis can give vital clues to the language competence of the children tested.

8. Sample

Data was collected twice in 1977, at a pretest in February, and the posttest in November. The interview was administered once only, in October 1977. All children enrolled in the programs and in the control group were tested on the vocabulary test (Circus I) while only 'core group' children, a sub-sample randomly selected within each program and the control group were given the syntax measure. The 'core group' children were also interviewed, in order to collect samples of their speech.

The distribution of the sample used for the language evaluation is set out in Table 2.

TABLE 2: Distribution of the sample over the programs.

TEST	PROGRAM					CONTROL
Measure	Cognitive	Competency	Contemporary	Behaviour-ist	Home-Base	Control
Syntax	19	17	17	11	23	13
Vocabulary	61	35	54	39	43	34
Interview	19	17	16	11	23	-

At the pretest the sample on whom data were collected on the syntax measure was 20 for the control group and the Cognitive, Competency, Contemporary and Behaviourist Programs. Thirty were tested from the Home-Based program because the Child Interview was administered to the same sample.

On the vocabulary measure, all children enrolled at the preschool were tested i.e. 80 children for each school-based program, 62 for the Home-Based program and 34 for the control group. However for all measures, data was used only in cases where both pretest and posttest were available. These are the numbers presented in Table 2.

9. Test Administration

Both Circus 1 and the Syntax Test had been successfully used with children of this age group (3.9 - 4.6 years) by other researchers (Circus 1 Manual 1974, Fraser, Bellugi & Brown, 1963; Fernald, 1972; Lovell & Dixon, 1967; Nurss & Day, 1971). The reliability coefficients of both tests as measured by the Kuder-Richardson formula for internal consistency are set out in Appendix C.

a) Circus 1

Circus I was designed as a diagnostic instrument for use by the classroom teacher (Circus I Manual, 1974). The manual accompanying the Circus tests recommends that the tests, except one, be administered to small groups of children. Small group administration would be ideal for a classroom test, but was rejected as a method of data collection for the present Project study. All children were tested individually by trained testers.

The test requires the children to display their comprehension of labels by pointing to the correct picture referent. Each subject was required to attempt forty items, having successfully completed the practice items. Subjects were presented with an array of three pictures. The experimenter would then say "Look at these three pictures. Listen carefully. Apple. Point to the apple."

Instructions were presented as outlined in the manual, except that the subject responded by pointing instead of marking a score sheet. Pointing was preferred because there was less likelihood of the child making a mistake in indicating his selection. The practice items were used to establish the response of selective pointing, i.e. subjects were trained to point to one and only one picture for each item.

b) Syntax Test

Each subject was required to attempt ten problems, made up of ten different grammatical contrasts. Each problem was represented by a pair of sentences. e.g. "The boy is sitting/ The boy is not sitting." These sentences are identical except for the addition of the negative marker in the second sentence. The absence of the marker in the first sentence requires recognition of the affirmative structure by the subject, just as its presence in the second sentence requires recognition of the negative.

For each of the two sentences, there is an appropriate picture, carefully designed so that the only difference coded is that which the contrast is testing. In the comprehension task, the response elicited is one of pointing rather than speaking. If only two pictures were presented, one representing each utterance of the contrast, the probability of a subject selecting the correct answer by chance is 50% on the first utterance. This was considered unacceptably high, although the original researchers claim that an actual analysis of their data revealed a probability of chance success at less than 50% (Fraser, Bellugi and Brown, 1963).

Subjects were presented with an array of four pictures, two of these representing the utterances of the contrast being tested and two others.

Each subject was required to perform three operations with the materials, imitation, comprehension and production. The experimenter had a firm protocol to follow in presenting each task. There was however, a provision that a child would be expected to give an appropriate answer, and that 'novel response irrelevant to the material being tested would not be scored incorrect. In such an instance, the experimenter would present the item again at a later stage in the testing session. The absence of this provision in scoring can lead to the scores on the production task being artificially lowered (Fernald, 1972).

For the comprehension task, the experimenter shows the subject an array of four pictures and says -

i) "Look at these four pictures. I am going to tell you stories that match two of them. Then I want you to point to the picture that matches the story I say.

ii) The boy is sitting. The boy is not sitting.

iii) Show me 'The boy is sitting'. (Subject points)

iv) Show me 'The boy is not sitting'. (Subject points)"

The appropriate response to the comprehension task is pointing, and the practice items are used to establish the pattern of pointing to only one picture at any one time.

In both the imitation and production procedures, the subject is required to respond by selecting and repeating an utterance already modelled by the experimenter.

For the imitation task, no pictures are used. The experimenter proceeds as follows:

i) "I want you to listen carefully to the two sentences I am going to say. Then I am going to ask you to say them one at a time for me.

ii) The fish is eating. The fish are eating.

iii) Say 'The fish is eating' (Subject repeats utterance)

iv) Say 'The fish are eating' (Subject repeats utterance)."

In the production procedure, two pictures are used, one to match each utterance. As in the comprehension task, the subject hears the experimenter say both utterances, but is not told which utterance goes with which picture.

i) Experimenter says "Look at these two pictures. I am going to tell you two stories which match the pictures. Then I want you to tell me the sentence that goes with the picture I point to.

ii) The boy pushes the girl. The girl pushes the boy.

iii) The experimenter points to one picture, and says 'Say the sentence that goes with this picture. (Subject makes appropriate statement).

iv) Experimenter points to remaining picture and says 'Say the sentence that goes with this picture. (Subject makes appropriate reply).

v) If subject makes a novel response or does not reply on either occasion, the experimenter says 'Is it 'The boy pushes the girl,' or 'The girl pushes the boy?' (Subject makes appropriate statement)."

All relevant responses were scored as either correct or incorrect. All responses for the imitation and production tasks were audio-taped, so that an analysis of errors could be carried out at a later stage.

c) The Child Interview

The aim of this semi-structured interview was to encourage the child to talk in a relatively unstructured, relaxed way. Only two people were present during the session, the experimenter and the selected child. The experimenter attempted to establish rapport with the child to be tested by spending some time in the preschool with them, and by sitting close by the child to encourage warmth and confidentiality.

A toy model of a home, complete with plastic figures of a family, and house furniture was used as stimulus materials. Objects were used because they were more inherently motivating and elicited longer, more complex responses from children at a pilot testing than did pictures. The experimenter initiated the session by saying "I have some toys here that we can play with. (Puts toys on table) You can unpack it, and set it up in any way you like. While you're doing that tell me what's happening at the house."

From this point the experimenter's role was to respond to the child's initiatives and activities, and to play and participate in the game if invited to do so by the child. If the child found it difficult to get going, the Experimenter would say something like "Shall I make the father do something, and you say what it is I am making him do." The child was then given an opportunity to perform his own actions with the model. Once a reasonable sample of speech had been collected, and the child was willing to stop play, the session was ended.

The entire dialogue of the session was audio-taped, and transcriptions made from these tapes at a later stage.

10. Results

a) Vocabulary and Syntax

The major component of the data analysis was to assess whether program variables were responsible for any differences recorded in the scores on both the basic syntax and vocabulary measures. In addition, the data was analysed to ascertain whether there were any sex differences in performance.

At the pretest in February 1977, on both the vocabulary and syntax measures, there were no significant differences between the performances of children in different programs. These results are set out in Tables 3 and 4. In addition, there was no significant difference in the performance of boys and girls.

The posttest data revealed significant differences in scores obtained by children in different programs in both the vocabulary test, and the comprehension subtest of the syntax test. On the vocabulary test, differences were found among the scores of children in some of the programs. Children in the Behaviourist ($p<.01$), Competency ($p<.01$) and Home-Based ($p<.05$) programs achieved significantly higher mean scores than children in the Cognitive program ($p<.01$). These results are presented in Table 5 and indicate that the Behaviourist, Competency and Home-Based programs achieved higher mean scores in vocabulary than the Cognitive or Contemporary programs.

TABLE 3: Pre Test Means and Standard Deviations for Preschool Children in the Five Programs and Control Group: Vocabulary and Syntax Measures

MEASURE	PROGRAM											
	Cognitive		Competency		Contemporary		Behaviourist		Home-Base		Control	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Vocabulary	22.44	5.50	21.45	5.25	22.03	5.77	22.87	5.46	22.32	5.14	24.58	4.83
Syntax												
Imitation	18.21	2.43	17.59	1.86	16.15	3.45	18.16	1.28	16.08	2.80	17.21	1.85
Comprehension	11.80	2.84	11.02	2.58	12.15	3.31	12.91	2.88	10.10	3.08	10.86	1.58
Production	11.08	3.88	10.76	2.45	11.99	2.77	10.28	2.93	10.52	3.12	9.80	3.67

TABLE 4: Multivariate Analysis of Variance for Scores Obtained by Preschool Children in the Pretest Vocabulary and Syntax Tests

1. CIRCUS 1 VOCABULARY

Effect	SS	DF	MS	F	P less than
GH+	220.312	5	44.062	1.532	.183
G	207.242	5	41.448	1.433	.213
H	2.041	1	2.041	.071	.791

2. SYNTAX

Effect	Test of Roots	F	DF Hyp	DF Err	P less than
GH	1 through 3	.688	15.000	237.810	.795
	2 through 3	.312	8.000	229.826	.961
	3 through 3	.277	3.000	212.452	.842
G	1 through 3	2.048	15.000	237.810	.013
	2 through 3	1.412	8.000	229.826	.192
	3 through 3	.449	3.000	212.452	.718
H	1 through 1	1.348	3.000	86.000	.264

Univariate F Tests for Program (G)

Variable	F (5,88)	M.S.	P less than
Imitation	2.293	15.063	.052
Comprehension	2.176	18.569	.064
Production	.843	7.961	.523

+ G = Program (Cognitive, Competency, Contemporary, Behaviourist, Control)
H = Sex

There are a number of reasons relating to both objectives and classroom practices that may explain this result. For example, in the Behaviourist and Competency programs, specific activities occurred which may explain the higher mean score gained by children in those programs on the vocabulary measure. In both programs, teachers planned directed learning experiences for small groups to develop language skills, e.g. ability to label, ability to explain and ability to describe. These were usually teacher-structured and designed to have a specific outcome. The development of language skills which would assist in later school activities was an important objective for children in these programs. It is possible that activities carried out to develop these increased the children's vocabulary.

In the Home-Based program teachers may have been successful in implementing home programs for children and in developing the mother's skills in interacting with the children. It is possible that these activities promoted the development of the children's syntactic abilities.

The results of the syntax test showed that there were no differences in scores obtained by children in different programs on the imitation and production subtest. However, on the comprehension subtest, children in the Cognitive program ($p<.05$) achieved significantly higher mean scores than children in the Home-Based program. In addition, there was no significant difference in the performance of boys and girls ($F = 1.348$, $p<.264$). These results are presented in Tables 5 and 6.

In the comprehension task of the syntax test, children were required to point to the picture that matched a given sentence from an array of 4 pictures. The pictures were line drawings. The Cognitive program, with its emphasis on the development of representation skills engendered greater ability in recognising and decoding line drawings than children in the Home-Based program. Such skills were probably less emphasised in the Home-Based program than in other programs. On this basis, a significantly higher mean score might be predicted for the Cognitive program when compared to the children in the control group. This result did not occur. The control group and the Home-Based group may be viewed as different from the other groups in some important ways. The control group was largely a volunteer group and may have attracted some more competent families. The Home-Based group, however, included some children enrolled because it was believed that specific intervention would assist both the child and the family in preparing for formal school experiences. This indicates that the characteristics of these two groups could be expected to differ markedly. This explanation, together with the specific practices of the Cognitive program outlined earlier would account for the significantly higher scores obtained by children in the Cognitive program when compared with scores of children in the Home-Based program.

The practices of the different programs did not influence the children's syntactical development as measured by imitation and production. It is possible that these skills require specific rehearsal of a particular method to show dramatic improvement, or it may be that insufficient time was allocated by the programs to the development of these skills.

TABLE 5: Post Test Means and Standard Deviations for Preschool Children in the Five Programs and Control Group: Vocabulary and Syntax Measures.

MEASURE	PROGRAM											
	Cognitive		Competency		Contemporary		Behaviourist		Home-Base		Control	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Vocabulary	27.24	5.39	30.77	4.50	26.54	6.13	31.28	3.81	30.02	4.71	30.82	3.91
Syntax												
Imitation	18.84	1.15	18.44	1.73	18.17	2.13	18.81	1.48	16.93	2.58	17.46	3.42
Comprehension	15.36	2.21	14.07	2.90	14.00	3.04	14.25	2.31	12.50	2.54	14.46	2.72
Production	11.42	3.10	13.00	2.29	11.30	4.46	11.76	2.55	11.48	2.85	11.23	3.04

TABLE 6: Multivariate Analysis of Variance for Scores Obtained by Preschool Children in the Posttest Vocabulary and Syntax Tests

1. CIRCUS 1 VOCABULARY

Effect	SS	DF	MS	F	P less than
GH+	150.394	5	30.079	1.212	.304
G	876.786	5	175.357	7.066	.001**
H	.575	1	.575	.023	.879

2. SYNTAX

Effect	Test of Roots	F	DF Hyp	DF Error	P less than
GH	1 through 3	.885	15.000	237.810	.582
	2 through 3	.340	8.000	229.826	.949
	3 through 3	.228	3.000	212.452	.877
G	1 through 3	1.777	15.000	237.810	.039*
	2 through 3	.710	8.000	229.826	.682
	3 through 3	.425	3.000	212.452	.735
H	1 through 1	.866	3.000	86.000	.462

Univariate F Tests for Program (G)

Variable	F (5,88)	Mean Square	P less than
Imitation	2.293	15.063	.052
Comprehension	2.176	18.569	.064
Production	.843	7.961	.523

* Significant at .05 level
** Significant at .001 level

+ G = Program (Cognitive, Competency, Contemporary, Behaviourist, Control)
H = Sex

In addition the nature of syntactic learning in the preschool year appears to be developmentally governed. Various examples have shown that while children are grammatically sophisticated enough to hear and comprehend adult grammatical forms, young children often persist with their own developmentally appropriate forms despite instructions to repeat exactly adult models (McNeill, 1966a). While there are some children who need assistance, most children appear to develop the basic structural resources. It is in the areas of variety of language use, i.e. using language structure for a range of functions (Tough, 1974) or to serve a range of cognitive functions that disadvantaged children show losses. The children in the sample show a command of basic English structures commensurate with the language development of young children 3.9 - 4.9 years.

b) The Child Interview

Interviews where fifty or more utterances were collected were analysed on three measures of syntactic complexity. A corpus of fifty utterances is considered a reliable sample (Darley & Moll, 1960). Three indexes were computed to assess the complexity of syntax used by the children.

Firstly, the Mean Length of Utterance (M.L.U.) was calculated to indicate the level of syntactic development shown in the speech of the children. M.L.U. has had wide use in research on children's language development and is considered 'the best single index of the level of speech development' (Brown, 1973). M.L.U. has also been used to grade the difficulty of grammatical structures presented to children (Menyuk, 1963b).

Secondly, two indexes devised by Cazden (1965) were calculated to denote syntactic complexity in the structure of the noun and verb phrases used by the children. These indexes were called the Noun Complexity Index (N.C.I.) and the Verb Complexity Index (V.C.I.).

M.L.U. was calculated by summing the number of morphemes in all utterances in the corpus and dividing the total by the number of utterances in the corpus. The Noun Complexity Index and Verb Complexity Index were given a weighted score according to guidelines set down by Cazden (1965). Linguistic structures which occurred in the present protocols but were not listed in Cazden's categories, were assigned to relevant categories on the basis of linguistic complexity. A complete entry of paradigms for scoring each noun and verb phrase is set out in Appendix E.

The data were analysed by Multivariate Analysis of Variance techniques (MANOVA) (Clyde, 1969) to find out whether there were any differences in performance on the basis of program or sex. There were no differences among programs or between boys and girls in scores given for M.L.U., Noun Complexity Index and Verb Complexity Index. The F ratios obtained were not significant at the .05 level. These results are set out in Table 7 and 8.

TABLE 7: Means and Standard Deviations for Preschool Children in the Five Programs: Mean Length of Utterance (M.L.U); Noun Complexity Index (N.C.I) and Verb Complexity Index (V.I.I)

	PROGRAM									
	Cognitive		Competency		Contemporary		Behaviourist		Home Base	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Mean length of utterance (M.L.U.)	4.086	1.038	4.915	1.076	4.106	1.117	4.786	2.246	4.169	1.044
Noun Complexity Index (N.C.I.)	1.813	0.183	1.900	0.159	1.892	0.151	1.929	0.238	1.875	0.143
Verb Complexity Index (N.C.I.)	1.740	0.089	1.815	0.188	1.750	0.390	1.900	0.163	1.825	0.154

TABLE 8: Multivariate Analysis of Variance for scores obtained by preschool children on Mean Length of Utterance (MLU); Noun Complexity Index (NCI) and Verb Complexity Index (VCI)

Effect	Test of Root	F	DF Hyp	DF Error	P less than
GH	1 through 3	1.314	12.000	140.516	.217
	2 through 3	.668	6.000	130.639	.676
	3 through 3	.038	2.000	108.000	.963
G	1 through 3	1.387	12.000	140.516	.179
	2 through 3	.768	6.000	130.639	.597
	3 through 3	.110	2.000	108.000	.896
H	1 through 1	1.647	3.000	53.000	.190

(c) Analysis of Errors

The errors children make in both spontaneous speech and in a test situation can indicate the level of their competence in language. In the present evaluation, errors children made on the production task in the posttest were analysed so general statements on competence could be made, in accordance with the evaluation model outlined earlier in this paper.

Previous research into children's errors and corrections of language forms showed that -

i) a grammatically simpler form was used in place of a more complex one (Menyuk, 1964). Children relied on forms they understood.

ii) other criteria than syntactic ones were used to form a corrected sentence, e.g. semantic criteria (de Villiers & de Villiers, 1974). Children tended to 'make sense' of the task.

iii) some items which are expressed in simple syntactic forms represent difficult conceptual distinctions, e.g. mass noun/count noun. These items tend to produce errors even though the syntax is simple (Cazden, 1968).

In the present data the most common error noted was the substitution of one structure for another. Items were presented in contrast form, i.e. two utterances were stated and the subject had to say the utterance which matched the designated picture. While it could be argued that this type of error is an artifact of the test procedure, some interesting trends are evident. The frequency of this type of error, where one of the presented sentences was matched with the wrong picture, is presented below in Table 9.

Responses in the three items (2,3,7) requiring control over the system of plurality were interesting. In all three instances, twice as many substitutions of singular for plural forms were made. This implies that when faced with the task of producing a plural form, the better understood singular form was substituted. This error was consistently found and tends to discount that this response was an artifact of the presentation format.

Item 2 (The kitten plays/the kittens play) requires the child to use both the morphological system (attachment of the plural morpheme) and the transformational system (selective inflection of noun or verb). Errors could be made because the child has not completely sorted out the morphological and transformation rules begin to develop before the inflectional rule system is complete (Cazden, 1968). Since most children can correctly use the 'z' morpheme (Berko, 1958), it would appear that the transformation for distinguishing sentences with singular and plural subjects have not been learned in a consistent way.

A similar pattern can be noted when discussing the items dealing with the formation of future and past tense from the present progressive form. The present progressive form is correctly used in 90% of cases at 2.75 years (Cazden, 1968). None of the children in the same study had reached this criterion on the past tense form at 4.00 years. The modal auxiliary system which includes shall/will shows considerable growth in the preschool years (Shields & Steiner, 1971). The predictive use of 'will', which includes the traditional future tense, only showed a 24% incidence in the spontaneous speech of the Shields and Steiner sample. Future action was often expressed by parallel constructions such as 'is going to'. The analysis of errors shows that the present progressive is often preferred to the more difficult future and past forms.

TABLE 9: Frequency of substitution errors on syntax test

STRUCTURE	N	TYPE OF SUBSTITUTION
1. MASS NOUN/COUNT NOUN		
a) a banana/some banana	24	count for mass ('some' for 'a')
b) a cake/ some cake	13	mass for count ('a' for 'some')
2. SINGULAR/PLURAL INFLECTIONS		
a) The kitten plays/the kittens play	16	(plural for singular)
b) The boy draws/the boys draw	33	(singular for plural)
3. SINGULAR/PLURAL (IRREGULAR VERB - IS/ARE)		
a) The sheep is jumping/the sheep are jumping	22	(plural for singular)
b) The deer is running/the deer are running	42	(singular for plural)
4. PRESENT PROGRESSIVE/PAST TENSE		
a) The cat is climbing/the cat climbed	18	(past for present progressive)
b) The paint is spilling/the paint spilled	30	(present progressive for past)
5. PRESENT PROGRESSIVE/FUTURE TENSE		
a) The girl is drinking/the girl will drink	9	(future for present progressive)
b) The bird is flying/the bird will fly.	27	(present progressive for future)
6. AFFIRMATIVES/NEGATIVES		
a) The boy is sitting/the boy is not sitting		All responses were correct
b) The girl is cooking/the girl is not cooking		
7. SINGULAR/PLURAL 3RD PERSON POSSESSIVE		
a) Her dog/their dog	22	(plural for singular)
b) His wagon/their wagon	40	(singular for plural)
8. SUBJECT/OBJECT ACTIVE VOICE		
a) The boy pushes the girl/the girl pushes the boy	10	(object becomes subject)
b) The cat bites the dog/the dog bites the cat	8	(object becomes subject)
9. SUBJECT/OBJECT, PASSIVE VOICE		
a) The dog is chased by the cat/the cat is chased by the dog	4	(object becomes subject)
b) The mummy is kissed by the daddy/the daddy is kissed by the mummy	15	(object becomes subject)
10. INDIRECT OBJECT/DIRECT OBJECT		
a) The boy brings the bird the fish/the boy brings the fish the bird	16	(indirect object becomes direct object)
b) The girl shows the cat the dog/the girl shows the dog the cat.	15	(indirect object becomes direct object)

An evaluation of other errors that children made in dealing with the material presented in the test reveals not only their grammatical competence, but also the strategies they use in giving answers. Three general types of response were noted, contractions, syntactic substitutions and semantic substitutions. Examples of these errors given by the children are presented in Table 10

A full record of contracted forms, whether or not they constituted errors, was kept because these forms give clues as to the level of the children's syntactic competence. A contracted form is one where one or more syntactic component are missing. Usually this means that the utterance given is not grammatically well-formed.

The use of syntactic and semantic substitutions not only indicates the level of the children's competence, but also reveals strategies used to solve the problem as presented. If a child uses a syntactic substitution, it would appear that the problem is viewed as a syntactic one to be resolved by use of syntactic knowledge. A semantic substitution would indicate that the child is using other methods of making sense of the problem. The response will reflect this.

The analysis of errors showed that the children in the sample could understand and produce syntactically well-formed sentences. Deviant, or even incomplete forms were rarer than well-formed sentences. Item 6, Singular/ Plural, 3rd Person Possessive Pronouns, produced a large percentage of deviant forms (see Table 10). Research shows that the different case forms of the possessive pronouns are not correctly generalised by children of the preschool age group. This item also produced the deviant forms (him's dog/her's dog). The children appear to understand the task and to be using whatever elements available in their syntactic competence to solve it.

Classification of responses on items 9 and 10 reveal some strategies that the children are using to analyse the task. Clearly the children understand both the nature of the task and the sense of the sentence. Where syntactic substitutions are made, the sense of the sentence is kept intact and expressed by a different, simple syntactic form. In the passive voice item for example, the crucial factor is that the noun phrase in the position of subject is not the agent of the action, as it is in active voice clauses. A far greater percentage of the errors replaced the passive voice with the active and kept the sense than those which lost the sense (61 cases to 8 cases). Similarly shortened forms omitted the subject, the problematic element. Children preferred to specify the recipient of the action than its agent.

Similar patterns and strategies can be noted in the errors made on item 10. The indirect object is the element that is difficult to process for it is interspersed between the verb and the direct object, between which there is usually a close, proximal relationship. Shortened forms then tended to omit the indirect object while keeping sense intact (35 cases). The other frequently noted shortened forms were all incomplete sentences indicating that some subjects had difficulty handling the combination of length of utterance and the syntactic complexity of the indirect object structure.

The main syntactic strategy noted for dealing with this item is the replacement of the indirect object by a prepositional phase. eg. The boy brings the fish to the bird. This, as predicted, is a simpler syntactic form than the indirect object form and places the direct object in close relationship with the verb.

TABLE 10: TYPES AND FREQUENCY OF ERRORS IN ITEMS 1-10 OF SYNTAX TEST

ITEM	STRUCTURE	CONTRACTIONS	N	SYNTACTIC SUBSTITUTION	N	SEMANTIC SUBSTITUTION	N
1	Mass noun Count noun	Omission of a/some	6	-		eg. Whole banana Big banana All cake Half banana	16
2	Singular/Plural	-		eg. The kittens are playing The kitten is playing The kitten played The kittens play	11	-	
3	Singular/Plural	Omission of auxiliary eg. Deer running Running	4				
4	Present/Progressive/Past Tense	Omission of auxiliary eg. Cat climbing Climbs The paint spilling	25	The cat did climb The paint is spilled The paint has spilled	7	The paint is going to spill	2
5	Present/Progressive/Future tense			The girl was drinking	1	The bird won't fly The girl isn't drinking Starting to drink The bird is going to fly The girl is going to drink	20
6	Singular/Plural 3rd person possessive pronouns			The wagon/dog Them wagon The wagon, That wagon Him dog) Him's dog)over-correction Her's dog)	30		
7	Affirmative/negative		ALL	RESPONSES WERE	CORRECT		
8	Subject/Object	Omission of auxiliary The girl pushing the boy The boy pushing the girl Cat biting the dog Dog biting the cat	18				
9	Subject/Object Passive voice	Omission of subject Kissed by the daddy Kissen the mummy Kissing by mummy	6	Active for Passive (Sense intact) The cat is chasing the dog The dog is chasing the cat The daddy kissed the mummy The mummy kisses the daddy Active for Passive (reversal of agent/recipient roles)	61 8		
10	Direct/Indirect object	Omission of Indirect object eg. the boy brings the fish The boy brings the bird The girl shows the dog The girl shows the cat Incomplete Sentence eg. Carrying the fish The fish the bird The boy brings The bird and the fish Shows the dog and the cat Shows the dog Shows the dog the cat	35 11	Prepositional Phrase for Indirect Object The boy brings the fish to the bird The boy brings the bird to the fish The girl shows the cat to the dog The girl shows the dog to the cat	43	The boys bring the bird to show the fish	3

Semantic substitutions were rare. Evidently the material on the test was structured so that the children realised that syntactic decisions were to be made. Item I, the mass noun/count noun contrast (a cake/some cakes) was an interesting exception. In this case it is difficult to distinguish the problem of syntax (the correct placement of a/some) and that of reference (the meanings of a/some). The words themselves have no concrete reference, but when used in conjunction with other words, carry an extra meaning. This type of language structure has been described as having more 'cognitive weight' and therefore conceptually more difficult to process (Cazden, 1968).

The most common error was confusing 'a' for 'some' and vice versa. Semantic substitutions formed the next largest category, including responses such as 'whole banana', 'big banana' etc. These references were only accepted if the child insisted on giving them on a repeated trial. The frequency of semantic substitutions given as a first reply was probably much higher. The substituted words have a more precise semantic meaning with clear reference, and indicate that the children were using semantic meaning with clear reference, and indicate that the children were using semantic criteria to make judgments on this item. A few responses omitted the 'a' or 'some'. Perhaps for these children, the distinction made by these words is not clear.

Another interesting result noted in the error analysis is that children often omitted the auxiliary in their contractions, indicating that their control of the auxiliary system of English is not fully developed. Other studies of preschool children provide support for this result (Shield, 1974). The response analysis in general reinforces the earlier statement that the children in the sample show a level of syntactic development suitable to their age group.

11. Conclusion

In essence, the study provided some information on the effects that the programshad on the development of young children's language. Evidence indicated that vocabulary appears to be an area which is affected by the type of program children experience at preschool. However, data indicated that children's syntactic development, as measured by a syntax test, M.L.U. noun phrase complexity index and verb phrase complexity index, was consistent across the programs.

In the present study, the more structured programs, which outlined sequential content for children to learn and suggested ways in which it might be taught, produced a better performance among the children in vocabulary than did less structured programs. In the case of the Home-Based program, where children also did well on the vocabulary test, controlled interaction styles developed by the mothers who were in constant close contact with the children could have engendered a development in vocabulary skills. Other researchers have suggested that both a structured learning situation and the interaction styles adopted are important factors in a language environment designed to foster language development (Cazden, 1972b).

An attempt was made to expand on test information by looking at children's language development by collecting speech samples and by analysing errors made by children when responding in the syntax test. The children produced more well-formed sentences than deviant or even incomplete ones, in responses to the syntax test. Comparison with the results of previous research indicated that the children on Mt Druitt were able to use syntactic structures appropriate to their age group.

This study was based on a model emphasising both competence and performance in language. The measures and techniques used provided a detailed description of the language abilities of Mt Druitt children within the defined limits set down by the model.

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APPENDICES

APPENDIX A: List of words used in Circus 1: 'What words mean'

APPENDIX B: List of utterances used in Syntax Test:

Imitation
Comprehension
Production

APPENDIX C: K-R 20 Coefficients: Vocabulary and Syntax Test

APPENDIX D: Scheffé - A Posteriori Tests - Post Test Results:
Circus I Vocabulary
Comprehension Subtest, Syntax Test.

APPENDIX E: Scoring for Noun Complexity Index, and Verb Complexity Index

APPENDIX A: List of words used in Circus 1 - What words mean.

Subscale 1 Nouns	Subscale II Verbs	Subscale III Modifiers
1. Apple	21. Reading	33. Wet
2. Round	22. Tearing	34. Shiny
3. Heel	23. Pouring	35. Straight
4. Whale	24. Running	36. Surprised
5. Front	25. Holding	37. Full
6. Row	26. Floating	38. Soft
7. Typewriter	27. Leaning	39. Wobbly
8. Bridge	28. Sprinkling	40. Active
9. Triangle	29. Wrapping	
10. Nephew	30. Fitting	
11. Patch	31. Balancing	
12. Curtain	32. Stare	
13. Artist		
14. Brick		
15. Garbage		
16. Insect		
17. Jungle		
18. Furniture		
19. Jewellery		
20. Musician		

APPENDIX B: List of utterances used: Basic Syntax Test.

(i) Imitation

a string	some string
The boy runs	The boys run
The fish is eating	The fish are eating
The boy is jumping	The boy jumped
The baby is sleeping	The baby will sleep
The girl is reading	The girl is not reading
His boat	Their boat
The train bumps the car	The car bumps the train
The girl is washed by the boy	The boy is washed by the girl
The mother shows the girl the boy	The mother shows the boy the girl

(ii) Comprehension

a cake	some cake
The boy draws	The boys draw
The deer is running	The deer are running
The paint is spilling	The paint spilled
The girl is drinking	The girl will drink
The girl is cooking	The girl is not cooking
His wagon	Their wagon
The cat bites the dog	The dog bites the cat
The mummy is kissed by the daddy	The daddy is kissed by the mummy
The girl shows the cat the dog	The girl shows the dog the cat

APPENDIX B (Cont.)

(iii) Production

a chicken	some chicken
The kitten plays	The kittens play
The sheep is jumping	The sheep are jumping
The cat is climbing	The cat climbed
The bird is flying	The bird will fly
The boy is sitting	The boy is not sitting
Her dog	Their dog
The girl pushes the boy	The boy pushes the girl
The dog is chased by the cat	The cat is chased by the dog
The boy brings the bird the fish	The boy brings the fish the bird

APPENDIX C

K. R. 20 COEFFICIENTS: VOCABULARY SYNTAX TESTS

1. CIRCUS 1		
	Pre-test	Post-test
KR 20	.706	.784
SEM	2.882	2.525
2. BASIC SYNTAX TEST		
	Pre-test	Post-test
KR 20	.719	.774
SEM	3.186	2.944

APPENDIX D

PRE-SCHOOL POST TEST RESULTS. SCHEFFÉ A POSTERIORI TESTS

Programs: A = Cognitive
B = Competency
C = Contemporary
D = Behaviourist
E = Home-Based
F = Control Group

CIRCUS 1 VOCABULARY TEST

F. RATIOS

AB	10.688
AC	0.502
AD	15.585 **
AE	7.724
AF	5.779
BC	15.206 **
BD	0.257
BE	0.369
BF	0.549
CD	20.164 **
CE	11.843 *
CF	8.945
DE	1.281
DF	1.560
EF	0.030

F. Ratios :

$F_{(5,260)}$: $\alpha = .05$ $F = 2.21$

$\alpha = .01$ $F = 3.02$

$F^{1}_{(5,260)}$ $\alpha = .05$ $F = 11.05$
$\alpha = .01$ $F = 15.1$

* $p < .05$

** $p < .01$

APPENDIX D (Cont'd.)

PRE-SCHOOL POST TEST RESULTS. SCHEFFÉ A POSTERIORI TESTS

Programs: A = Cognitive
B = Competency
C = Contemporary
D = Behaviourist
E = Home-Based
F = Control Group

SYNTAX TEST: COMPREHENSION SUB-TEST

F. RATIOS

AB	2.07
AC	2.32
AD	1.80
AE	11.80 *
AF	0.87
BC	0.006
BD	0.027
BE	3.35
BF	0.15
CD	0.06
CE	3.03
CF	0.22
DE	3.14
DF	0.04
EF	4.41

F. Ratios:

$F_{(5,94)}$: $\alpha = .05$ $F = 2.30$

$F^{1}_{(5,94)}$ $\alpha = .05$ $F = 11.5$

* $p<.05$

APPENDIX E (i) SCORING THE NOUN COMPLEXITY INDEX

Score of 1 :	N: doggie
	N + N : Candy cane
Score of 2 :	M + N : my Mummy, some lollipop
	N + pl: cars
Score of 3 :	A + M_A + N : a good idea
	M + N + pl : my lips, two mines
	N + poss + N : Andy's pocket
Score of 4 :	M_A + M_A + N : some more red
	A + M_A + N + pl : the big ones
	M + N + poss + N : my Mummy's house
Score of 5 :	M_A + M_A + N + pl : little tiny pieces
	A + M_A + M_A + N : a little tiny crack
	N + poss + N + pl : baby's balls
	A + M + poss + N : a lot of people
Score of 6 :	A + M_A + M_A + M_A + N : another big old bug
	A + M_A + M_A + N + Pl : the two big ones

APPENDIX E (ii) SCORING THE VERB COMPLEXITY INDEX

Score of 1 :

Unmarked v : I go, you put

Imperatives : Come up!

Infinitive :

Irregular past or pP : he fell, it gone

Score of 2 :

prP alone : he going out

third person singular, present: she cooks supper

regular past : I dropped it, I dood again

aux + unmarked, v : I'll make, she's climb
I could go : will I go?

v + v : She sits and eats

tags : don't I ? doesn't it?

Present of copula

Score of 3 :

aux + pP : there is only one more left, she has gone

aux + prP : I'm getting that

aux + v + ? : May I have a lollipop?

aux + preV + v : Mummy's gonna go bye bye

aux + v continuous

modal + aux + v : I should be going

Score of 4 :

aux + preV + v + v as an objective predicate :
I'm gonna let him knock this whole thing down

v + pre v + v : I keep on having to change

perfect modals : would have, should have, might have